NWCSAF GEO v2016. New products, changes and improvements.

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Introduction

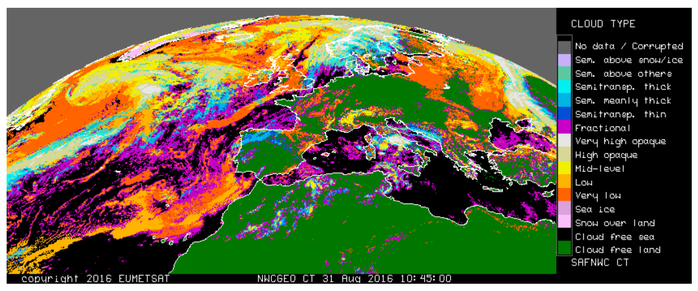
The objective of the Nowcasting Satellite Application Facility (NWC SAF) is the generation of satellite derived products for their direct application on Nowcasting for targeted users. To achieve this goal, the NWC SAF team develops, maintains and distributes software packages that allows the users to generate, at their premises and for the user defined area, satellite derived products with a direct application to Nowcasting. The NWC SAF distributes two different software packages for GEO and LEO satellites.
Current operational software package for GEO satellites is MSG v2013, distributed in 2013 and applicable to MSG data. Products generated with MSG v2013 include Cloud Products (Cloud Mask, Cloud Top Temperature and Height, Cloud Type, Cloud phase), Precipitation Products (Probability of Precipitation and convective rainfall rate and Probability of Precipitation and convective rainfall rate from Cloud microphysics), High Resolution Winds (HRW), Water content and Instability indices, Automatic Satellite Image Interpretation and detection and tracking of rapidly developing convective cells. After summer 2016, a new software package GEO v2016 will be distributed. Main changes and improvements of GEO v2016 respect to MSG v2013 are highlighted in this poster.

Technical changes

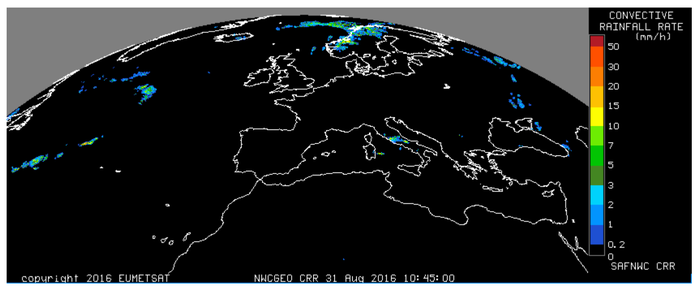
The NWC SAF software is modular, with a common library (NWCLIB) to all product modules and a Task Manager that organizes temporally the execution of different tasks. Some minor improvements in the Task Manager and a new version of the NWCLIB have been implemented. The new NWCLIB adds the capability to process data from other satellites than MSG and unifies common functions.
The radiative transfer model RTTOV, used to generate some of the products, has been upgraded to version 11.2
NetCDF has been adapted as new data output format with the objective of making it more user friendly. A trial set of output products is available to users in the NWC SAF website since May 2016.
All products have been technically adapted to the new library NWCLIB and have adopted the NetCDF format as output data format. Optionally output of High Resolution Winds product can be in BUFR format.

Improvements of current products

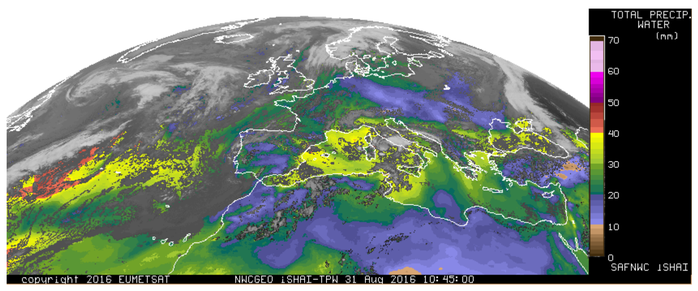
Cloud Mask: Use of radiative transfer model RTTOV on line to improve some thresholds, reduction of fire/cloud confusion. (Legleau et al., poster in this Conference)
Probability of precipitation and convective Rainfall rate derived from cloud microphysics products have been re-calibrated to be adapted to the new NWC SAF Cloud Microphysics product
Water content and Instability Indices (SphR): product name has been changed to iSHAI (imaging satellite Humidity and Instability indices). New additional outputs will be available: total column ozone and skin temperature.
High Resolution winds: a pressure level correction in the “CCC height assignment method” has been included. It is physically based on the cloud depth and makes use of the new parameters provided by new NWC SAF Cloud Microphysics (CMIC) product
Rapidly Developing Thunderstorm: more optional inputs, improvement of cell motion and expansion rate, forecast (+1h) of the cells, additional convective attributes.



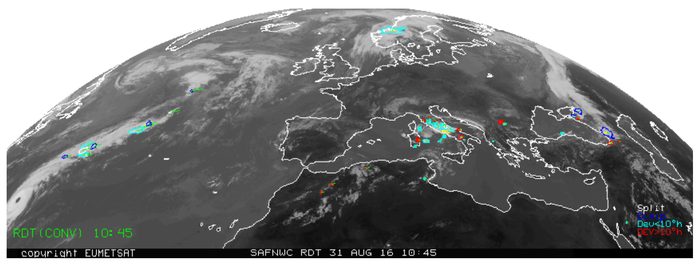
Cloud Type



Convective Rainfall Rate



Total Precipitable Water

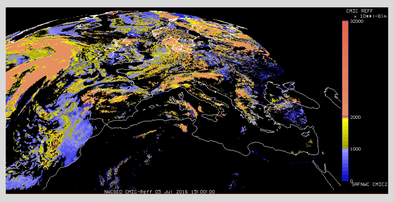


Rapidly Developing Thunderstorm

NWC SAF GEO v2016 products. 31 August 2016 10:45 UTC

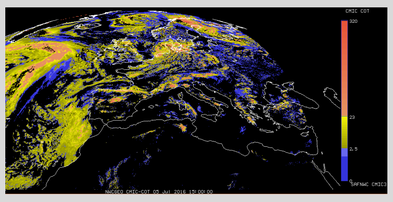
New products

CMIC (Cloud Microphysics). Day time Cloud microphysical properties are generated: cloud water path, effective radius and optical depth. (Legleau et al., poster in this Conference).

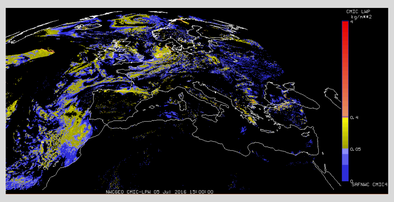


Effective Radius

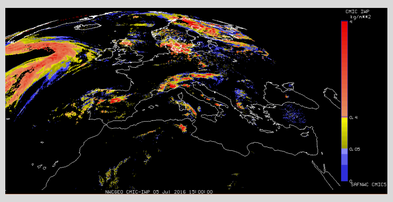
5 July 2016 15:00 UTC



Cloud Optical Thickness

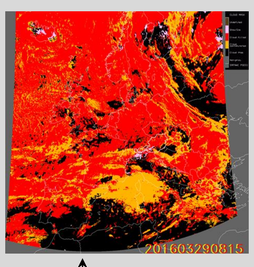


Liquid Water Path

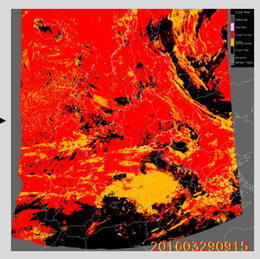


Ice Water Path

EXIM (Extrapolated Imagery): extrapolation of MSG images and NWC SAF products using the NWC SAF HRW winds. Product in development, to be delivered to the users at a later state.

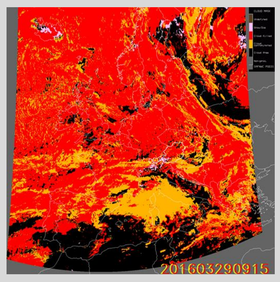


Cloud Mask extrapolated product 08:15 → 09:15



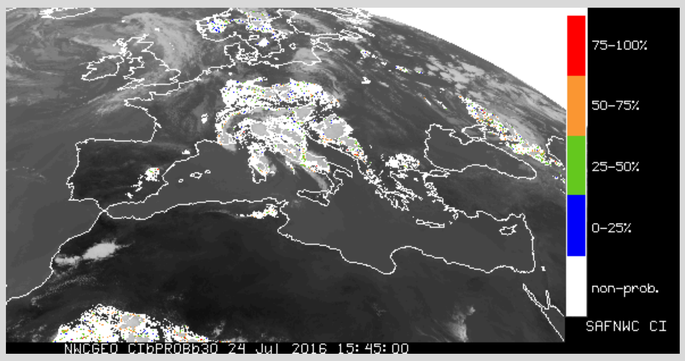
CMa 08:15

CMa 09:15



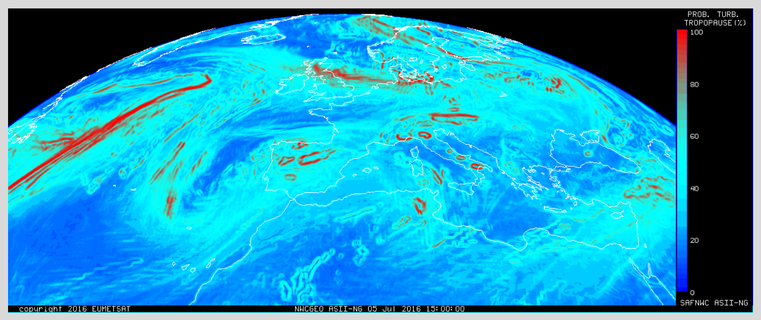
29 March 2016

CI (Convection Initiation): Probability of a cloudy pixel to become a thunderstorm in a given following period range. Demonstrational status.



24 July 2016 15:45 UTC –CI Probability that a cloudy pixel becomes a thunderstorm in the following 30 min.

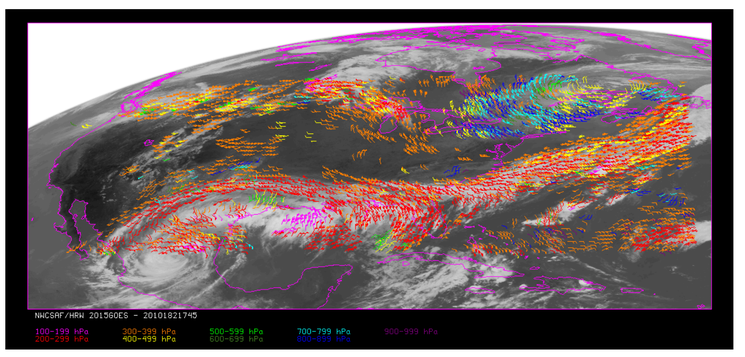
ASII-NG (automatic Satellite Image Interpretation-New Generation): probability of occurrence of meteorological phenomena. First release GEOv2016: probability of occurrence of tropopause folding, demonstrational status.



5 July 2016 15:00 UTC- probability of occurrence of tropopause folding

Adaptation of HRW product to GOES-N satellites

This is the first step towards the adaptation of the NWC SAF products to other satellites than EUMETSAT satellites. Other satellite data are read with a tool implemented by Météo-France and transformed to a format readable by the NWCLIB. The tool will be made available to users in the NWC SAF web site when the new version GEO v2016 is distributed.
Cloud Mask, Cloud Type, Cloud Top Temperature and High, High Resolution Winds and EXIM products have been technically adapted to process GOES-N data.
High Resolution Winds product has been fully validated to process GOES-N data. An example of the HRW product with GOES-N can be seen in the figure.



NWC/GEO High Resolution Winds v2016 AMV output example in the Continental United States region (1 July 2010 1745Z, GOES13 satellite)

Information, documentation, licence and software: http://www.nwcsaf.org

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